
	Division of Environmental Health and Communicable Disease Prevention	
	<b>Section: 4.0 Diseases and Conditions</b>	Updated 7/03
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## West Nile Virus Fever

### **Overview** <sup>(1, 2, 3, 4)</sup>

For a more complete description of arboviral infection, refer to the following texts:

- Control of Communicable Diseases Manual (CCDM).
- Red Book, Report of the Committee on Infectious Diseases.
- Epidemic/Epizootic West Nile Virus in the United States: Revised Guidelines for Surveillance, Prevention, and Control, Centers for Disease Control and Prevention, April 2001
- West Nile Virus: A Primer for the Clinician, Annals of Internal Medicine, August 2002.


### **Case Definition** <sup>(5)</sup>

#### ***Clinical description***

A non-specific, self-limited, febrile illness caused by infection with West Nile virus, a mosquito-borne flavivirus. Clinical disease generally occurs 2-6 days (range, 2-15 days) following the bite of an infected mosquito. Typical cases are characterized by the acute onset of fever, headache, arthralgias, myalgias, and fatigue. Maculopapular rash and lymphadenopathy generally are observed in less than 20% of cases. Illness typically lasts 2-7 days.

#### ***Laboratory criteria for diagnosis***

- Fourfold or greater change in virus-specific serum antibody titer, or
- Isolation of virus from or demonstration of specific viral antigen or genomic sequences in tissue, blood, cerebrospinal fluid (CSF), or other body fluid, or
- Virus-specific immunoglobulin M (IgM) antibodies demonstrated in CSF by antibody-capture enzyme immunoassay (EIA), or
- Virus-specific IgM antibodies demonstrated in serum by antibody-capture EIA and confirmed by demonstration of virus-specific serum immunoglobulin G (IgG) antibodies in the same or a later specimen by another serologic assay (e.g., neutralization or hemagglutination inhibition).

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### **Case Classification**


*Confirmed:* A clinically compatible illness that is laboratory confirmed.

*Probable:* A clinically compatible illness with WNV-specific serum IgM antibodies detected by antibody-capture enzyme immunoassay but with no available results of a confirmatory test for WNV-specific serum neutralizing antibodies in the same or a later specimen.

*(Note: Some West Nile fever cases progress to West Nile meningitis or encephalitis. Cases meeting the more restrictive case definition of West Nile encephalitis/meningitis should be reported as such and only once, using event code 10056 for “West Nile Encephalitis or Meningitis”.)*

### **Comments**

- In some persons, West Nile virus-specific serum IgM antibody can wane slowly and be detectable for more than one year following infection. Therefore, in areas where West Nile virus has circulated in the recent past, the co-existence of West Nile virus-specific IgM antibody and illness in a given case may be coincidental and not necessarily diagnostic of an *acute WNV infection*. Since WNV is known to have circulated in Missouri in 2002, suspected cases of acute WNV fever in subsequent years must be confirmed by one or more of the laboratory procedures noted above.
- Identification of an active human infection with WNV is an important event that usually triggers public health alerts, mosquito control measures, and media attention. The surveillance case definition above for WNV fever is a public health tool intended only for the surveillance of health events in populations. It is not intended for use in clinical diagnosis or management decisions in individual cases. Proper interpretation of laboratory results includes considering clinical context, travel history, flaviviral vaccination history, and evidence of previous and current WNV activity in the region.
- The seasonality of arboviral transmission is variable and depends on the geographic location of exposure, the specific cycles of viral transmission, and local climatic conditions. Because closely related arboviruses exhibit serologic cross-reactivity, positive results of serologic tests using antigens from a single arbovirus can be misleading. In some circumstances (e.g., in areas where two or more closely related arboviruses occur, or in imported arboviral disease cases), it may be epidemiologically important to attempt to identify the infecting virus by conducting cross-neutralization tests using an appropriate battery of closely related viruses. This is essential, for example, in determining that antibodies detected against West Nile virus are not the result of an

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infection with St. Louis encephalitis or dengue virus, or vice versa. Because dengue fever and West Nile fever can be clinically indistinguishable, the importance of a recent travel history and appropriate serologic testing cannot be overemphasized.

### **Information Needed for Investigation**

**Verify the diagnosis.** What laboratory tests were conducted? What were the results? What are the patient's clinical symptoms?

**Establish the extent of illness.** Determine if household or other members in the community are, or have been ill with compatible symptoms, by contacting the health care provider, patient, and family members.

**Contact the Regional Communicable Disease Coordinator** if an outbreak is suspected or if laboratory specimens will be submitted.

### **Case/Contact Follow Up And Control Measures**


- Area clinicians and hospitals should be notified if cases are occurring in the geographical area so that surveillance can be increased.
- Obtain the patient's travel history for the two weeks prior to onset of illness.
- Determine whether patient has received blood or blood products or an organ transplant in the preceding four weeks. Also determine whether patient has donated blood, blood products or an organ in the preceding two weeks.

### **Control Measures**

- See the Control of Communicable Diseases Manual, Mosquito-borne Viral Encephalitides, "Methods of control."
- See the Red Book, Arboviruses, "Control Measures."
- See the Prevention and Control section of the Epidemic/Epizootic West Nile Virus in the United States: Revised Guidelines for Surveillance, Prevention, and Control, Centers for Disease Control and Prevention, April 2001; in particular, the subsection "Vector Management in Public Health Emergencies."
- See the Prevention section of West Nile Virus: A Primer for the Clinician, Annals of Internal Medicine, August 2002.

### **NOTE:**

- When sporadic cases occur, large-scale mosquito control measures are not economically feasible. Municipalities and urban areas may implement local control measures to reduce mosquito populations.
- Some mosquitoes are weak flyers and tend to live close to their hatching sites. Birdbaths, wading pools, dog bowls, and other artificial containers of water should be emptied weekly to eliminate mosquito-breeding areas. Road ditches should be properly graded to

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allow water to drain. Rain gutters should be cleaned annually (every spring). Tires are notorious breeding places for mosquitoes.

- Private wastewater treatment facilities such as sewage treatment lagoons should be maintained to reduce mosquito breeding.

## **Laboratory Procedures**

*Specimens received at the Missouri Department of Health and Senior Services State Public Health Laboratory for arbovirus serology will be tested against antigens of:*

- Flavivirus group – this includes West Nile virus and St. Louis encephalitis virus
- Eastern equine encephalitis (EEE) virus
- Western equine encephalitis (WEE) virus
- LaCrosse/California encephalitis group viruses

*Two procedures are available:*

- IgM antibody detection on acute serum and acute CSF
- IgG antibody detection on paired sera.

*Specimen collection:*


- For IgM arbovirus antibody panel collect acute serum 0 to 10 days after onset of symptoms; collect CSF as soon as possible after onset of symptoms.
- IgG antibody testing will only be performed on acute and convalescent serum samples when a positive IgM result has been obtained. The IgG results will be used to determine recent versus past infection.
- Collect convalescent serum 2 to 3 weeks after acute serum was collected.
- Collect serum in a red top vacutainer tube. It is best to send serum and not whole blood; however, whole blood may be sent if no method is available for removing serum.
- At least 0.5 ml of serum and 1.0 ml of CSF is required for serological testing.
- All acute serum specimens will be tested for IgM antibody against the appropriate arbovirus panel. Because of the possibility of a false negative IgM, it is recommended that a convalescent specimen also be tested.

*Submission form:*

- Complete Missouri Department of Health and Senior Services, "Viral Serology Test Request," (MO 580-0762 ). This form is located in this Section and at: [http://www.dhss.state.mo.us/Lab/arbovirus\\_fax\\_form.pdf](http://www.dhss.state.mo.us/Lab/arbovirus_fax_form.pdf) (3 June 2003)
- Under "Test Requested" section, write "Arbovirus Serology."

*Laboratory test results:*

- Testing results will normally be available 3 to 10 days after specimen receipt.

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- See [http://www.dhss.state.mo.us/Lab/west\\_nile\\_virus.htm](http://www.dhss.state.mo.us/Lab/west_nile_virus.htm) (3 June 2003) for guidance on interpreting arboviral panel IgM and/or IgG test results and for additional information on submitting specimens.
- Specimens for serological testing should be kept cool (refrigerator temperature) but not frozen until ready to be shipped. Send serum and CSF specimens at room temperature. Shipping containers are available upon request from the State Public Health Laboratory. Ensure specimens are packed securely to prevent breakage.


## **Reporting Requirements**

West Nile virus fever is a Category II disease and shall be reported to the local health authority or to the Missouri Department of Health and Senior Services (DHSS) within three days of first knowledge or suspicion.

1. For all cases, complete a “Disease Case Report” (CD-1).
2. For all cases, complete an “Arboviral Case Report” form (MO 580-2601).
3. Entry of the completed CD-1 into MOHSIS negates the need for the paper CD-1 to be forwarded to the Regional Health Office.
4. Send the completed secondary investigation form to the Regional Health Office.
5. All outbreaks or “suspected” outbreaks must be reported as soon as possible (by phone, fax, or e-mail) to the Regional Communicable Disease Coordinator. This can be accomplished by completing the Missouri Outbreak Surveillance Report (CD-51).
6. Within 90 days of the conclusion of an outbreak, submit the final outbreak report to the Regional Communicable Disease Coordinator.

## **References**

1. Chin, James, ed. “Mosquito-borne Viral Encephalitides.” Control of Communicable Diseases Manual. 17<sup>th</sup> ed. Washington, DC: American Public Health Association, 2000: 39-43.
2. American Academy of Pediatrics. “Arboviruses.” In: Peter, G., eds. 2000 Red Book: Report of the Committee on Infectious Diseases. 25<sup>th</sup> ed. Elk Grove Village, IL. 1997: 170-175.
3. Epidemic/Epizootic West Nile Virus in the United States: Revised Guidelines for Surveillance, Prevention, and Control, Centers for Disease Control and Prevention, April 2001, U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, National Center for Infectious Diseases, Division of Vector-Borne Infectious Diseases, Fort Collins, Colorado, <http://www.cdc.gov/ncidod/dybid/westnile/resources/wnv-guidelines-apr-2001.pdf> (3 June 2003)
4. Petersen, Lyle R., and Marfin, Anthony A. West Nile Virus: A Primer for the Clinician, *Annals of Internal Medicine*, 2002; 137:173–179.

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- Missouri Department of Health and Senior Services - Section for Communicable Disease Prevention, surveillance case definition. (Modified from Centers for Disease Control and Prevention Recommended Surveillance Case Definition for West Nile Fever; National Center for Infectious Diseases, Division of Vector-Borne Infectious Diseases, Arbovirus Diseases Branch; Draft 2002.10.29.1)

### **Other Sources of Information**

- Shope, Robert E. and James M. Meegan. "Arboviruses." Viral Infections of Humans Epidemiology and Control; 4<sup>th</sup> ed. Eds. Alfred S. Evans and Richard A. Kaslow. New York: Plenum, 1997: 151 – 179.
- Special West Nile Virus Edition of Emerging Infectious Diseases Journal. Aug 2001; 7(4). <http://www.cdc.gov/ncidod/eid/vol7no4/contents.htm> (3 June 2003).
- The Merck Veterinary Manual. 8<sup>th</sup> Ed. Ed. Susan E. Aiello. Whitehouse Station, NJ: Merck & Co., Inc., 1998: 2184. <http://www.merckvetmanual.com/mvm/index.jsp> (search "West+Nile+fever"). (3 June 2003)

### **Web Resources and Information**

- Centers for Disease Control and Prevention, West Nile Virus Web Page, <http://www.cdc.gov/ncidod/dvbid/westnile/index.htm> (3 June 2003).
- Centers for Disease Control and Prevention, CDC Arbovirus Home Page, <http://www.cdc.gov/ncidod/dvbid/arbor/index.htm> (3 June 2003).

# **West Nile Virus**

## **FACT SHEET**

### **What is West Nile virus?**

The West Nile virus is transmitted by mosquitoes to birds, various animals, and humans. Most persons infected with this virus show no symptoms, although occasional infections can result in serious illness and even death.

### **Where did West Nile virus come from?**

West Nile virus has been commonly found in humans, birds, and other animals in Africa, Eastern Europe, Western Asia, and the Middle East, but until 1999 had not previously been documented in the Western Hemisphere. The U.S. viral strain is most closely related genetically to strains found in the Middle East.

### **What are the symptoms of West Nile virus infection?**

Most people infected with this virus do not have any symptoms. Some people experience a mild illness characterized by slight fever, headache, body aches, skin rash, and swollen lymph nodes. More severe illness can include encephalitis (inflammation of the brain) or meningitis (inflammation of the tissues that cover the brain and spinal cord). Severe manifestation of West Nile virus is marked by a rapid onset of a high fever, head and body aches, neck stiffness, muscle weakness, disorientation, coma, tremors, convulsions, and in the most severe cases, death.

### **How soon after exposure do symptoms appear?**

Symptoms usually appear 3 to 15 days after exposure.

### **What if I am pregnant?**

There is one documented case of transplacental (mother-to-child) transmission of WNV in humans. Although the newborn in this case was infected with WNV at birth and had severe medical problems, it is unknown whether the WNV infection itself caused these problems or whether they were coincidental. More research will be needed to improve our understanding of the relationship - if any - between WNV infection and adverse birth outcomes. The U.S. Centers for Disease Control and Prevention recommends that pregnant women use an insect repellent that contains DEET to prevent infection with mosquito-borne diseases.

### **How do people get West Nile virus?**

The West Nile virus, like most mosquito-borne viruses, is found in wild and domestic birds. When a mosquito feeds on an infected bird, it can pick up the virus and transmit it to other, noninfected birds. Occasionally, infective mosquitoes will feed on mammals such as horses, dogs, cats, and humans, and transmit the virus to them.



**If I live in an area where birds or mosquitoes with West Nile virus have been reported and a mosquito bites me, am I likely to get sick?**

No, even in areas where mosquitoes do carry the virus, very few mosquitoes—much less than 1%—are infected. If the mosquito is infected, less than 1% of people who get bitten and become infected will get severely ill. The chances you will become severely ill from any one-mosquito bite are extremely small.

**Can I get West Nile virus directly from birds?**

Although transmission of WNV and similar viruses to laboratory workers is not a new phenomenon, two recent cases of WNV infection of laboratory workers have been reported. There is no evidence that a person can get the virus from simply handling live or dead infected birds. However, persons should avoid barehanded contact when handling any dead animals and use gloves or double plastic bags to place the carcass in a garbage can.

**How can I report a sighting of dead bird(s) in my area?**

Contact your local or state health department if you observe dead birds, particularly crows and blue jays. Health officials will determine whether the event should be investigated and whether bird specimens should be submitted to a laboratory for testing.

**Can West Nile virus be spread from person-to-person?**

A recent investigation has confirmed WNV transmission through transplanted organs and/or blood products. However, beyond this particular unique transmission pathway, West Nile virus infection is not transmitted from person to person. For example, you cannot get West Nile virus from touching or kissing a person who has the disease, or from a health care worker who has treated someone with the disease.

**How can I protect myself from West Nile virus?**

It is not necessary to limit any outdoor activities. However, you can and should try to reduce your risk of being bitten by mosquitoes. Mosquitoes are most active at dawn and dusk. Reducing the mosquito population around your home and property can be accomplished by eliminating standing water:

- Dispose of tin cans, plastic containers, ceramic pots or similar water-holding containers.
- Remove all discarded tires on your property. Used tires are very significant mosquito breeding sites.
- Drill holes in the bottoms of recycling containers that are kept outdoors.
- Make sure roof gutters drain properly, and clean clogged gutters in the spring and fall.
- Turn over plastic wading pools and wheelbarrows when not in use.
- Change the water in birdbaths at least weekly.
- Clean vegetation and debris from edges of ponds.

- Clean and chlorinate swimming pools, outdoor saunas, and hot tubs.
- Drain water from pool covers.
- Use landscaping to eliminate standing water that collects on your property.

In addition to reducing standing water in your yard, make sure all windows and doors have screens, and that all screens are in good repair. If West Nile virus is found in your area:

- Wear long-sleeved shirts and long pants whenever you are outdoors.
- Spray clothing with repellents containing permethrin or DEET since mosquitoes may bite through thin clothing. Apply insect repellent sparingly to exposed skin. An effective repellent will contain 35% DEET (N, N-diethyl-meta-toluamide). DEET in high concentrations (greater than 50%) provides no additional protection. Repellents may irritate the eyes and mouth, so avoid applying repellent to the hands of children. Whenever you use an insecticide or insect repellent, be sure to read and follow the manufacturer's DIRECTIONS FOR USE, as printed on the product.

### **What should hunters do to protect themselves against West Nile**

**virus?** The West Nile virus has been isolated in white tail deer, rabbits, and squirrels. Hunters should follow the usual precautions when handling wild animals. They should wear gloves when handling and cleaning animals to prevent blood exposure to bare hands and meat should be cooked thoroughly. If hunters anticipate being exposed to mosquitoes, they should apply insect repellents to clothing and skin according to label instructions.

### **How is West Nile virus diagnosed?**

If you or your family members develop symptoms such as high fever, confusion, muscle weakness, and severe headache, you should see your health care provider immediately. Your health care provider will assess your risk for West Nile virus infection. If you are determined to be at high risk, your provider will draw a blood sample and send it to a laboratory for confirmation.

### **What is the treatment?**

There is no specific treatment for viral infections, other than to treat the symptoms and provide supportive care. In more severe cases, intensive supportive therapy is indicated, often involving hospitalization, intravenous fluids and nutrition, respiratory support, prevention of secondary infections, and good nursing care. Elderly persons are at highest risk for developing severe illness due to West Nile viral infection, so these individuals should promptly seek medical care if infection is suspected.

### **Is there a West Nile virus vaccine for humans?**

No, but several companies are working towards developing a vaccine.

**Missouri Department of Health and Senior Services  
Section for Communicable Disease Prevention  
Phone: (866) 628-9891 or (573) 751-6113**

# MOSQUITOES AND DISEASE

## Help keep mosquitoes out of our communities!

### Disease Transmitted by Mosquitoes

Mosquitoes carry many diseases transmitted to humans and animals. Mosquito-borne diseases known to occur in Missouri include several encephalitis viruses in horses and humans and heartworms in dogs. Arthropods (mosquitoes, ticks, etc.) are vectors that transmit disease organisms to humans and animals. Animals (birds, raccoons, rodents, etc.) that may harbor disease organisms naturally are reservoirs.

### St Louis Encephalitis (SLE) and West Nile Virus (WNV)

The Northern House Mosquito (*Culex pipiens*), the principle vector of both SLE and WNV, is found throughout Missouri. Birds such as house sparrows, blue jays, and finches may serve as reservoirs for these two closely related viruses. *Culex pipiens* can acquire SLE or West Nile virus while feeding on birds and is capable of transmitting the virus to people after 8 to 12 days. The Northern House Mosquito readily enters homes and bites people after dark. This small brownish mosquito is a weak flyer, seldom flying more than 200-300 yards from its breeding site. It breeds in dark or shaded, stagnant, organic matter-enriched water sources such as street-side catch basins, unkept polluted ditches, standing sewage effluent, and clogged rain gutters. Breeding areas such as birdbaths, flowerpot saucers, and stock tanks should have their water changed at least once a week, and discarded tires, boats, and canoes, should be covered or turned upside down to prevent rain from accumulating in them.

### Western Equine Encephalitis (WEE)

*Culex tarsalis*, the vector of WEE, has a virus transmission cycle similar to SLE. Although it is widely distributed, it is most common in rural habitats in the western part of Missouri. *Culex tarsalis* feeds primarily on birds in the spring and early summer months and has a preference for mammals during the later summer months, including humans and horses. This mosquito, a twilight biter, is a strong flier, capable of flying many miles from its breeding site. It breeds in pastures and ditches with aquatic vegetation and irrigation wastewater, preferring sunlit areas.

### La Crosse Encephalitis (LAC)

*Aedes triseriatus*, the vector of LAC, is distributed in forested areas throughout Missouri. *A. triseriatus* seldom flies far from its breeding sources and disease is restricted to localized mosquito populations. *A. triseriatus* breeds in tree holes of deciduous trees and will spread to adjacent areas where artificial containers such as cans, buckets, vases, tire casings, etc., may hold water. The Asian tiger mosquito, *Aedes albopictus*, recently introduced into the U.S., has requirements similar to *A. triseriatus* and has spread to many areas in Missouri. Although the Asian tiger mosquito is not yet involved as a vector of LAC virus in nature, it has significant potential to proliferate disease in Missouri communities. *A. triseriatus* and *A. albopictus* will bite readily during the daylight hours, increasing at twilight hours.

## Canine Heart Worm

There are numerous mosquito species that transmit heartworms to dogs. Mosquitoes feeding on infected dogs ingest the immature heartworm parasites. The parasite undergoes maturation in the mosquito, crawls out through the mouthparts at subsequent feedings, and penetrates the skin through the site of the bite. The tiny heartworms migrate through the tissues and establish in the chambers of the heart where they grow to maturity interfering with heart functions.

## What Can You Do?

You can help rid your property and community of mosquitoes by the following simple practices:

1. Eliminate containers such as tin cans, bottles, buckets, and old tires that may hold water.
2. Ensure gutter down spouts are cleared of debris.
3. Cover or store boats and wheelbarrows upside down.
4. Stock rock garden pools and lily ponds with mosquito-feeding minnows or goldfish.
5. Empty wading pools weekly and maintain backyard swimming pools properly.
6. Fill or drain low areas that may hold water for longer than a week.
7. Cover rain barrels, cisterns, or fire barrels with 16-mesh screen.
8. Drain livestock water tanks weekly, or stock with mosquito-feeding minnows or goldfish.
9. Install splash blocks to carry water away from foundations to eliminate water in crawl spaces.

## Where Do Mosquitoes Come From?

All mosquitoes require water to complete their life cycle. Only female mosquitoes bite. A blood meal usually is required before eggs will develop. Completion of the life cycle from egg to adult may require as little as 8-10 days.

## All Mosquitoes Are Not The Same

There are more than 50 species of mosquitoes in Missouri. Although most are not involved in transmitting disease to humans and animals, many are serious biting pests. Preferential feeding times are unique to each species. While one species might only feed at night, others may feed at dusk/dawn, or even during the day.

## Personal Protection

- Screen openings of your home.
- Avoid mosquito-infested areas when possible.
- Wear clothing that will provide protection (long sleeved shirts and long pants).
- Wear repellents that contain DEET.
- Avoid exposure during peak biting periods (twilight hours).

**Missouri Department of Health and Senior Services  
Section for Communicable Disease Prevention  
Phone: (866) 628-9891 or (573) 751-6113**

# **VIRAL SEROLOGY TEST REQUEST**

<b>1. Please provide the patient information requested.</b> <b>2. Type or print with pressure.</b> <b>3. Send all copies of this form with specimen to STATE PUBLIC HEALTH LABORATORY.</b>		DATE SPECIMEN COLLECTED ACUTE	DATE RECEIVED ACUTE	STATE LAB SERIAL NO.	
		CONV	CONV		
PATIENT NAME (LAST, FIRST)		ONSET	DATE CONV. REQ'D		
ADDRESS (CITY, STATE, ZIP CODE)		RUBEOLA/RUBELLA VACCINATION HISTORY	<b>FOR STATE HEALTH LAB USE ONLY</b>		
BIRTHDATE		<b>TEST REQUESTED:</b> Please indicate below, see back of form for test description.	DATE REPORTED		
SEX <input type="checkbox"/> Female <input type="checkbox"/> Male			<b>LABORATORY REPORT</b>		
RACE <input type="checkbox"/> W <input type="checkbox"/> B <input type="checkbox"/> A/P I <input type="checkbox"/> A I/AN <input type="checkbox"/> O/U			RUBEOLA EIA (IgM): <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Equivocal		
MEDICAID NUMBER		<input type="checkbox"/> Measles (Rubeola) IgM EIA	RUBELLA EIA (IgM): <input type="checkbox"/> Positive <input type="checkbox"/> Negative <input type="checkbox"/> Equivocal		
<b>The following information MUST BE PROVIDED before testing can be performed:</b>		<input type="checkbox"/> Rubella IgM EIA			
PERSON'S NAME AUTHORIZED TO RECEIVE PHONE RESULTS		<input type="checkbox"/> Arbovirus			
FACILITY/LAB PHONE NO.		<input type="checkbox"/> Rickettsial Panel			
FACILITY/LABORATORY NAME		<input type="checkbox"/> Other: CDC Referrals			
FACILITY/LABORATORY STREET/MAILING ADDRESS			MISSOURI DEPARTMENT OF HEALTH STATE PUBLIC HEALTH LABORATORY 307 W McCARTY, PO BOX 570 JEFFERSON CITY MO 65101		
FACILITY/LABORATORY CITY, STATE & ZIP CODE			EOAA EMPLOYER Services Provided on a non-Discriminatory Basis		



STATE OF MISSOURI  
DEPARTMENT OF HEALTH AND SENIOR SERVICES  
**ARBOVIRAL CASE REPORT**

NAME (LAST, FIRST, MI)								MOHSIS ID NO.		
								REPORT DATE ___ / ___ / ___		
PARENT'S NAME (IF NOT ADULT)				TELEPHONE NUMBER	ONSET DATE ___ / ___ / ___	DATE OF FIRST NEUROLOGIC SYMPTOM ___ / ___ / ___				
ADDRESS (INCLUDE CITY AND STATE)				COUNTY	DATE OF BIRTH ___ / ___ / ___	AGE				
PHYSICIAN NAME			PHYSICIAN'S ADDRESS			PHYSICIAN'S TELEPHONE NUMBER				
COUNTRY OF BIRTH			IF BORN OUTSIDE US, YEAR ARRIVED IN US		TENTATIVE DIAGNOSIS					
PLACE OF WORK		OCCUPATION		ADDRESS		TELEPHONE NUMBER				
HOSPITALIZED <input type="checkbox"/> Yes <input type="checkbox"/> No		HOSPITAL NAME		DATE OF ADMISSION ___ / ___ / ___		DATE OF DISCHARGE ___ / ___ / ___				
PREGNANT? <input type="checkbox"/> Yes, number of weeks _____ <input type="checkbox"/> No <input type="checkbox"/> Unknown				SEX <input type="checkbox"/> Male <input type="checkbox"/> Female						
RACE (CHECK ALL THAT APPLY) <input type="checkbox"/> Black <input type="checkbox"/> White <input type="checkbox"/> Hispanic <input type="checkbox"/> Asian <input type="checkbox"/> American Indian <input type="checkbox"/> Pacific Islander <input type="checkbox"/> Other (specify) _____										
<b>PERTINENT DIAGNOSTIC TESTS (ATTACH LAB RESULTS IF AVAILABLE), SYMPTOMS, AND TREATMENT</b>										
SPECIMEN	DATE	APPEARANCE	W.B.C	RBC	% LYMPHS	% POLYS.	PROTEIN	SUGAR	SMEAR	CULTURE
SPINAL FLUID	___ / ___ / ___									
TYPE OF SPECIMEN <small>Serum/CSF/Tissue</small>		TYPE OF TEST PERFORMED <small>ELISA, Virus Neut, PCR, FA, HI, Plaque Assay, Other</small>			RESULT	DATE COLLECTED ___ / ___ / ___		NAME OF LABORATORY		
						___ / ___ / ___				
						___ / ___ / ___				
						___ / ___ / ___				
(CHECK ALL THAT APPLY) <input type="checkbox"/> MRI <input type="checkbox"/> CT			DATE(S) ___ / ___ / ___    ___ / ___ / ___			RESULT(S)				
<input type="checkbox"/> EMG			DATE ___ / ___ / ___			RESULT				
HAS THE PATIENT EXPERIENCED ANY OF THE FOLLOWING SYMPTOMS DURING THE ILLNESS? <input type="checkbox"/> Yes <input type="checkbox"/> No    If yes, check all that apply.										
<input type="checkbox"/> Fever ≥ 100° Duration in days _____			<input type="checkbox"/> Muscle pains <input type="checkbox"/> Muscle weakness			<input type="checkbox"/> Urinary symptoms <input type="checkbox"/> Chest pain			<input type="checkbox"/> Tremors <input type="checkbox"/> Slurred speech	
<input type="checkbox"/> Headache			<input type="checkbox"/> Rash			<input type="checkbox"/> Shortness of breath			<input type="checkbox"/> Unconscious	
<input type="checkbox"/> Stiff Neck			<input type="checkbox"/> Nausea			<input type="checkbox"/> Cough			<input type="checkbox"/> Confusion	
<input type="checkbox"/> Photophobia			<input type="checkbox"/> Diarrhea			<input type="checkbox"/> Sore throat			<input type="checkbox"/> Seizures	
<input type="checkbox"/> Fatigue			<input type="checkbox"/> Vomiting			<input type="checkbox"/> Conjunctivitis (red eyes)			<input type="checkbox"/> Flaccid Paralysis	
<input type="checkbox"/> Swollen glands (Lymph nodes)			<input type="checkbox"/> Abdominal pain			<input type="checkbox"/> Altered mental status			<input type="checkbox"/> Other, Specify: _____	
<input type="checkbox"/> Joint pains			<input type="checkbox"/> Poor appetite			<input type="checkbox"/> Memory loss				
TREATMENT (TYPE, AMOUNT, DATES) <div style="text-align: right;">___ / ___ / ___    ___ / ___ / ___</div>										
<b>EXPOSURE HISTORY</b>										
HAS PATIENT HAD CONTACT WITH SICK/DEAD <input type="checkbox"/> Animals    or <input type="checkbox"/> Birds    in the 3 weeks prior to illness? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown										
IF YES, WHAT TYPE OF CONTACT OR ACTIVITY?										
LOCATION						DATE ___ / ___ / ___				
IN THE 3 WEEKS PRIOR TO ONSET OF ILLNESS, DID THE PATIENT RECALL BEING BITTEN BY MOSQUITOES? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown    If yes, specify when ___ / ___ / ___ and geographic location										
HAS THE PATIENT HAD CONTACT WITH TICKS (ATTACHED TO THE SKIN) IN THE 3 WEEKS PRIOR TO ONSET? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown    If yes, specify when ___ / ___ / ___ and geographic location										
DOES THE PATIENT USE INSECT REPELLENT WHILE OUTDOORS? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown    If yes, what brand?						IS THE COMMUNITY WHERE PATIENT LIVES BEST CLASSIFIED AS <input type="checkbox"/> Urban <input type="checkbox"/> Suburban <input type="checkbox"/> Rural				
IN THE IMMEDIATE SURROUNDINGS OF THE PLACE OF RESIDENCE, ESTIMATE THE AMOUNT OF										
Vegetation		<input type="checkbox"/> None		<input type="checkbox"/> Little		<input type="checkbox"/> Moderate		<input type="checkbox"/> Great		
Surface Water		<input type="checkbox"/> None		<input type="checkbox"/> Little		<input type="checkbox"/> Moderate		<input type="checkbox"/> Great		

		PATIENT'S NAME (LAST, FIRST, MI)			
DOES THE PATIENT'S RESIDENCE HAVE SCREENED WINDOWS AND DOORS? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown					
WERE THERE ANY SOURCES OF STAGNANT WATER AROUND THE HOME IN WHICH MOSQUITOES COULD BREED (SUCH AS TIRES, FLOWERPOTS, BIRDBATHS, CANS, OR WADING POOLS) THE 3 WEEKS BEFORE SYMPTOM ONSET? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown   If yes, please describe					
APPROXIMATELY HOW MANY HOURS PER DAY DID THE PATIENT SPEND OUTDOORS (BOTH LEISURE AND WORK)?					
TIME OUTSIDE IS DURING (CHECK ALL THAT APPLY) <input type="checkbox"/> Dawn <input type="checkbox"/> Morning <input type="checkbox"/> Noon <input type="checkbox"/> Afternoon <input type="checkbox"/> Dusk <input type="checkbox"/> Evening					
IN GENERAL, 3 WEEKS PRIOR TO ONSET OF THE ILLNESS, DID THE PATIENT PARTICIPATE IN ANY OF THE FOLLOWING ACTIVITIES OR VISIT ANY OF THE FOLLOWING LOCATIONS?					
a) Gardening	<input type="checkbox"/> Never	<input type="checkbox"/> Rarely	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Often	Where? _____
b) Fresh water swimming	<input type="checkbox"/> Never	<input type="checkbox"/> Rarely	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Often	Where? _____
c) Fishing	<input type="checkbox"/> Never	<input type="checkbox"/> Rarely	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Often	Where? _____
d) Hunting	<input type="checkbox"/> Never	<input type="checkbox"/> Rarely	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Often	Where? _____
e) Camping	<input type="checkbox"/> Never	<input type="checkbox"/> Rarely	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Often	Where? _____
f) Outdoor sport field or stadium event	<input type="checkbox"/> Never	<input type="checkbox"/> Rarely	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Often	Where? _____
g) Zoo	<input type="checkbox"/> Never	<input type="checkbox"/> Rarely	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Often	Where? _____
h) Parks	<input type="checkbox"/> Never	<input type="checkbox"/> Rarely	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Often	Where? _____
i) Other, specify	<input type="checkbox"/> Never	<input type="checkbox"/> Rarely	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Often	Where? _____
HAS THE PATIENT TRAVELED <input type="checkbox"/> Outside County <input type="checkbox"/> Outside Missouri <input type="checkbox"/> Outside USA   in last 3 weeks? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown					
IF YES, WHERE?		WHEN (DEPARTED) ____ / ____ / ____		RETURNED ____ / ____ / ____	
<b>HEALTH HISTORY</b>					
RECENT VACCINATIONS <input type="checkbox"/> Yes <input type="checkbox"/> No   If yes, type: _____		DATE ____ / ____ / ____		PRECEDING ILLNESS (IF YES, DIAGNOSIS AND DATE) <input type="checkbox"/> Yes <input type="checkbox"/> No   ____ / ____ / ____	
HAS PATIENT SERVED IN THE MILITARY? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk   If yes, dates of service ____ / ____ / ____ to ____ / ____ / ____					
HAS PATIENT EVER RECEIVED A VACCINATION AGAINST Yellow Fever <input type="checkbox"/> Yes <input type="checkbox"/> No   If yes, date of vaccination ____ / ____ / ____   Physician _____ Japanese Encephalitis virus <input type="checkbox"/> Yes <input type="checkbox"/> No   If yes, date of vaccination ____ / ____ / ____   Physician _____ Tick-borne Encephalitis (TBE) <input type="checkbox"/> Yes <input type="checkbox"/> No   If yes, date of vaccination ____ / ____ / ____   Physician _____					
DID PATIENT EVER HAVE VIRAL ENCEPHALITIS? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk   If yes, when ____ / ____ / ____			DID PATIENT EVER HAVE DENGUE FEVER? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unk   If yes, when ____ / ____ / ____		
DOES THE PATIENT HAVE HISTORY OF ANY OF THE FOLLOWING CONDITIONS PRIOR TO THE ONSET OF THIS ILLNESS? <input type="checkbox"/> Asthma <input type="checkbox"/> Lung Disease <input type="checkbox"/> Taking Steroids <input type="checkbox"/> Diabetes <input type="checkbox"/> HIV/AIDS <input type="checkbox"/> Other immune-suppressing disease (lupus, rheumatoid arthritis, etc) <input type="checkbox"/> Cancer <input type="checkbox"/> Cardiac Disease <input type="checkbox"/> Taking a blood thinner <input type="checkbox"/> Hypertension <input type="checkbox"/> Hepatitis <input type="checkbox"/> Pancreatitis <input type="checkbox"/> Alcohol abuse <input type="checkbox"/> Seizures					
HAS THE PATIENT RECEIVED A <input type="checkbox"/> Blood transfusion <input type="checkbox"/> Blood product <input type="checkbox"/> Organ transplant   or <input type="checkbox"/> Tissue transplant   within the last 4 weeks? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown   If yes, type of blood product, organ or tissue					
IF YES, WHERE?		TELEPHONE NUMBER		DATE OF PROCEDURE ____ / ____ / ____	
HAS THE PATIENT DONATED <input type="checkbox"/> Blood <input type="checkbox"/> Plasma <input type="checkbox"/> Organ   or <input type="checkbox"/> Tissue   within the last 2 weeks? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown					
IF YES, TYPE		WHERE		TELEPHONE NUMBER	
				DATE OF DONATION ____ / ____ / ____	
OUTCOME OF PATIENT <input type="checkbox"/> Survived <input type="checkbox"/> Died <input type="checkbox"/> Unknown			IF PATIENT DIED, DATE OF DEATH ____ / ____ / ____		
WAS AN AUTOPSY PERFORMED? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown			RESULTS		
<b>FINAL DIAGNOSIS</b>					
<input type="checkbox"/> West Nile Fever <input type="checkbox"/> Western Equine M/E <input type="checkbox"/> Venezuelan Equine M/E <input type="checkbox"/> Tick-borne M/E type if known: _____		<input type="checkbox"/> West Nile M/E <input type="checkbox"/> La Crosse M/E <input type="checkbox"/> Dengue		<input type="checkbox"/> St. Louis M/E <input type="checkbox"/> California M/E <input type="checkbox"/> Yellow Fever <input type="checkbox"/> Other: _____	
				<input type="checkbox"/> Eastern Equine M/E <input type="checkbox"/> Japanese M/E	
COMMENTS					
DATE ____ / ____ / ____		INVESTIGATOR		AGENCY	